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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/685,534	10/16/2003	Tatsuya Yamazaki	03560.003390.	5988

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EXAMINER
KIKNADZE, IRAKLI

ART UNIT	PAPER NUMBER
2882	

DATE MAILED: 11/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	**Application No.** 10/685,534	**Applicant(s)** YAMAZAKI ET AL.	
	Examiner Irakli Kiknadze	**Art Unit** 2882	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-14_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1014_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _16 October 2003_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _5/14/2004_.
4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5 and 12-14 are rejected under 35 U.S.C. 102(b) as being anticipated by Griesmer et al. (US Patent 5,379,335).

With respect to claim 1, Griesmer teaches (Fig.1) an X-ray imaging apparatus (2) comprising: X-ray generation means (4) for emitting X-rays; an X-ray detector (16) on which a grid (10) selected from a plurality of different types of grids (column 7; lines 30-35) is removable mountable, wherein the X-ray detector (16) receives the X-rays emitted from the X-ray generation means (4), and wherein the X-ray detector (16) obtains an X-ray image; the X-ray detector including an automatic exposure control (AEC) detector (36 and 38) for detecting the quantity of X-rays emitted from the X-ray generation means (4) and for outputting a signal based on the detected quantity; and control means (26) for controlling the X-ray generation means (4) and the AEC detector (36 and 38), wherein the control means (26) controls the X-ray generation means based on the signal output from the AEC detector (36 and 38), and wherein the control means (26) controls the AEC detector using correction data to correct an exposure detection element (36) forming a part of the AEC detector (column 5; lines 9-24 and column 6; lines 7-21).

With respect to claims 2 and 3, Griesmer teaches that the correction data relates to which of the plurality or none of different types of grids is mounted on the X-ray detector (16) (column 7; lines 30-35).

With respect to claim 4, Griesmer teaches storing means (22), wherein the control means (26) stores the correction data in the storing means (22) and wherein the control means (26) selects the correction data according to whether one of the plurality of different types of grids is mounted, and which type of the plurality of types of grids is mounted, and at least one other condition affecting the grid (10) (column 5; lines 54-66).

With respect to claim 5, Griesmer teaches the control means comprising correction data calculation means and wherein the control means (26) calculates the correction data based on the correction data stored in the storing means (22), in the case where no correction data corresponding to the at least one other condition is stored in the storing means (column 5; line 56 –column 6; line 21).

With respect to claim 12, Griesmer teaches a method for controlling an X-ray imaging apparatus (2) that has at least one automatic exposure control (AEC) pixel (36), including the steps of detecting in real-time part of an X-ray that is made incident via a subject, performing AEC based on a signal detected by the AEC pixel (36), and generating an X-ray image of the subject based on the X-ray that is made incident via the subject, comprising: calibrating the signal detected by the AEC pixel (36) according to a grid state; and performing AEC detection based on the calibrated detected signal (column 5; lines 9-23 and column 6; lines 7-21).

With respect to claims 13 and 14, Griesmer teaches a computer-executable process steps and medium for making a computer (26) perform a method for controlling an X-ray imaging apparatus (2) (column 5; line 55 – column 6; line 6-21).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 6-8 and 11 rejected under 35 U.S.C. 103(a) as being unpatentable over Griesmer et al. (US Patent 5,379,335) in view of Khutoryansky et al. (US Patent 6,047,042).

With respect to claim 6, Griesmer teaches claimed invention except for the correction data being a gain-correction data and/or dark-current correction data. Khutoryansky teaches an X-ray imaging apparatus comprising AEC system including control means using a correction data comprising of gain-correction data (column 13; line 64 – column 14; line 8) and/or dark-current correction data when source is off (column 13; lines 41-52) providing automatic calibration of the gain and offset. It would have been obvious to one of ordinary skill in art at the time the invention was made to employ the correction data teachings of Khutoryansky in the imaging apparatus of Griesmer in order to provide automatic calibration of the gain and offset of AEC system of the X-ray imaging apparatus.

With respect to claims 7 and 8, Griesmer teaches claimed invention except for the AEC detector comprising a plurality of exposure detection elements/pixels and wherein each pixel is formed as a detector element that can be read in non-destructive manner. Khutoryansky teaches (Figs. 1-3) an X-ray imaging apparatus comprising AEC system including an AEC detector (110) comprising a plurality of exposure detection elements/pixels and wherein each pixel is formed as a detector element that can be read in non-destructive manner from plurality of defined locations or regions on an associated imaging receptor (118) (column 7; lines 9-26). It would have been obvious to one of ordinary skill in art at the time the invention was made to employ the AEC teachings of Khutoryansky in the imaging apparatus of Griesmer to provide a plurality of exposure detection elements/pixels in order to estimate the X-ray-incident amount with precision and perform appropriate AEC regardless of the grid state (part of the AEC pixels may be blocked by the grid).

With respect to claim 11, Griesmer teaches claimed invention except for the AEC detector comprising a plurality of pixels formed as stripes of detector elements provided so as to be substantiality parallel to the orientation of stripes of the grid. Khutoryansky teaches (Figs. 1-3) an X-ray imaging apparatus comprising AEC system including an AEC detector (110) further comprising a plurality of exposure detection elements/pixels and wherein each pixel is formed as a detector element that can be read in non-destructive manner from plurality of defined locations or regions on an associated imaging receptor (118). The plurality of exposure detection elements/pixels is formed as an array and since gain correction is performed for each of the AEC pixels the sensitivities of the AEC pixels substantially increase (column 5; lines 12-15 and column 7; lines 9-26). It would have been obvious to one of ordinary skill in art at the time the invention was made to employ the AEC teachings of Khutoryansky in the imaging apparatus of Griesmer to provide the plurality of exposure detection elements/pixels from the plurality of locations formed as stripes of detector elements to be substantiality parallel to the orientation of stripes of the grid (part of the AEC pixels may be blocked by the grid) in order to estimate the X-ray-incident amount with precision and perform appropriate AEC regardless of the grid state.

5. Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Griesmer et al. (US Patent 5,379,335) in view of Possin et al. (US Patent 6,404,851 B1).

With respect to claim 9, Griesmer teaches claimed invention except for the AEC detector comprising a plurality of pixels and each pixel is formed as a thin film transistor (TFT)-detector element. Possin teaches a method and system for an automatic exposure control arrangement for a matrix-addressed imaging panel having (Fig.4) an array of sensors comprising a plurality of pixels and each pixel is formed as a thin film transistor (TFT)-detector element providing elements for real-time reading integrated into a solid-state image pickup element, near the pixels used for image detection (column 9; line 60 – column 10; line 9). It would have been obvious to one of ordinary skill in art at the time the invention was made to employ the AEC pixel arrangement teachings of Possin in the imaging apparatus of Griesmer to integrate the plurality of exposure detection elements/pixels near the pixels used for image detection in order to provide real-time reading of the X–ray amount with high precision.

With respect to claim 10, Griesmer teaches claimed invention except that the control means reads the signal output from the AEC detector in a cycle of 5 msec or less. Possin teaches a method and system for an automatic exposure control arrangement wherein the control means reads the signal output from the AEC detector in a cycle of 1 msec to avoid saturation (column 12; lines 7-15). It would have been obvious to one of ordinary skill in art at the time the invention was made to employ the AEC pixel reset teachings of Possin in the imaging apparatus of Griesmer to read the signal output from the AEWC detector in a cycle about every 1 msec in order to avoid saturation and provide real-time reading of the X–ray amount with high precision.

Conclusion

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Irakli Kiknadze whose telephone number is 571-272-2493. The examiner can normally be reached on 9:00- 5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ed Glick can be reached on 571-272-2490. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Irakli Kiknadze
November 15, 2004
IK

EDWARD J. GLICK
SUPERVISORY PATENT EXAMINER